REVISIONS			
LTR	**DESCRIPTION**	**DATE**	**APPROVED**

Prepared in accordance with ASME Y14.100 Selected item drawing

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OF PAGES	**PAGE**	1	2	3	4	5	6	7	8	9								

PMIC	**PREPARED BY** William Carpenter	**DEFENSE SUPPLY CENTER, COLUMBUS** **COLUMBUS, OHIO 43216-5000**
Original date of drawing 12 July 2004	**CHECKED BY** Lee Surowiec **APPROVED BY** Richard L. Taylor	**TITLE** **WIRE, ELECTRICAL, COMPOSITE, POLYAMIDE BRAID, POLYTETRAFLUOROETHYLENE/POLYIMIDE INSULATED, NORMAL WEIGHT, NICKEL COATED, COPPER CONDUCTOR, 260°C, 600 VOLT**
SIZE **A**	**CAGE CODE** **037Z3**	**DWG. NO.** **04038**
	REV	**PAGE** **1** OF **9**

AMSC N/A 6145-E060

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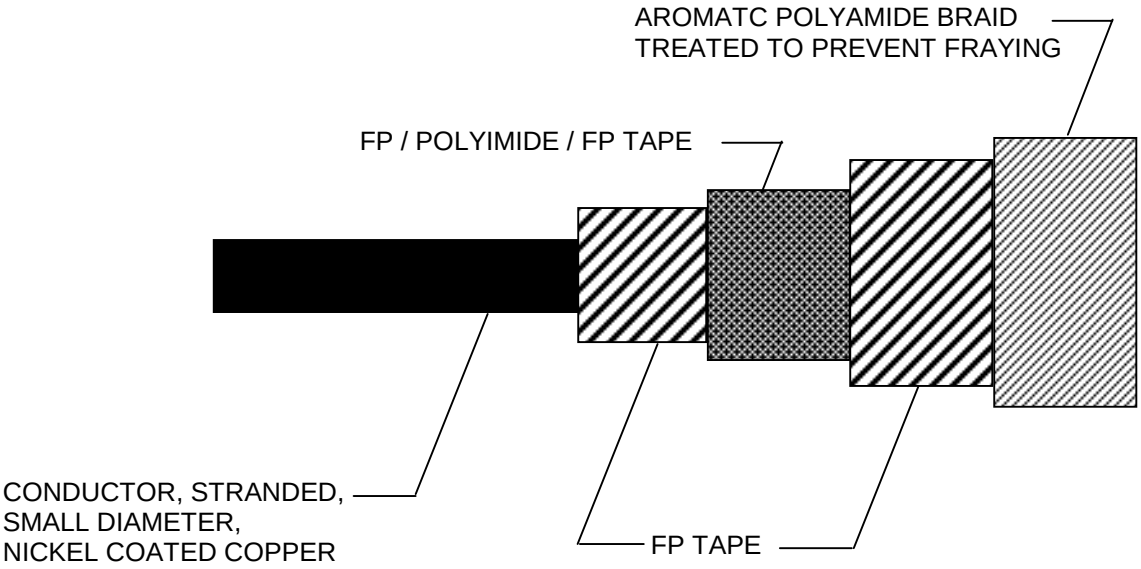
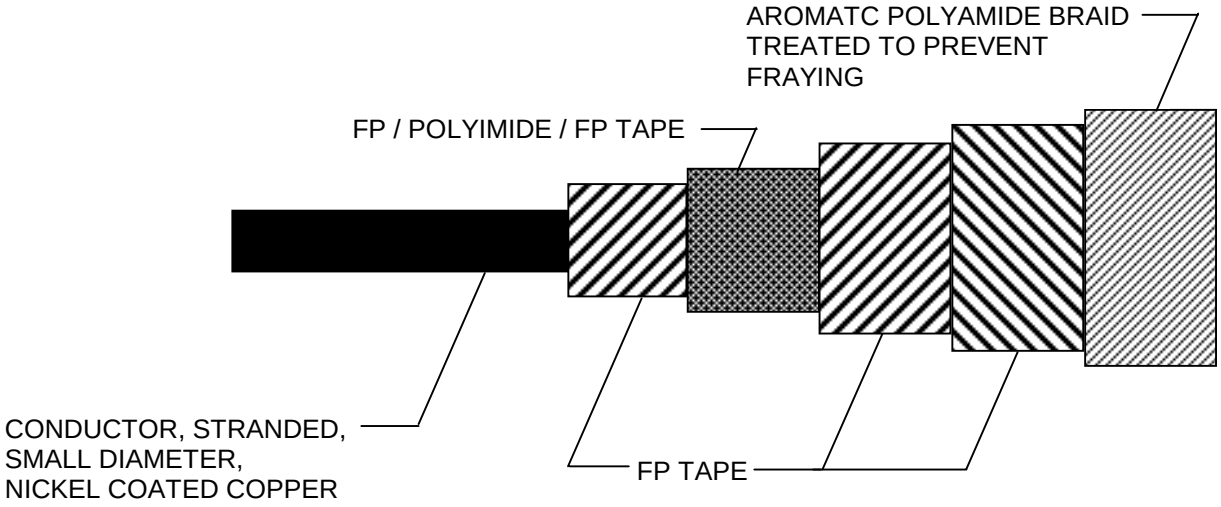


8 AWG through 6 AWG



4 AWG through 4/0 AWG

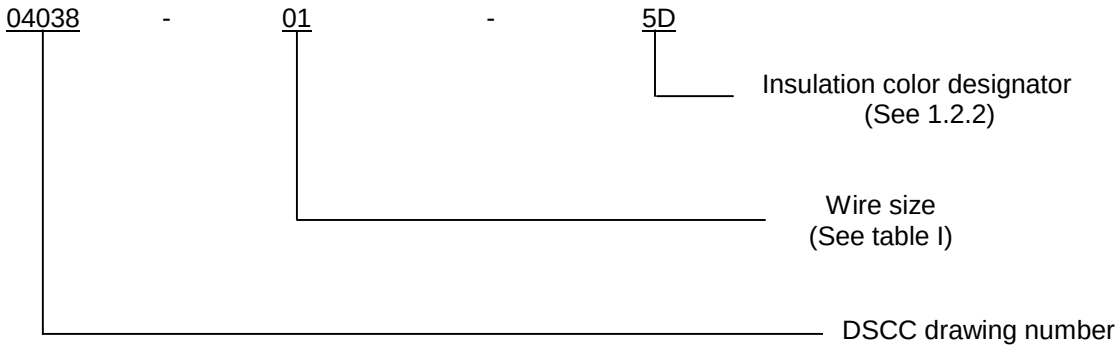
FP – Fluorocarbon Polymer, modified Polytetrafluoroethylene (PTFE)

FIGURE 1. General configuration.

1 SCOPE

1.1 Scope. This drawing covers the performance characteristics for a composite wire using a seamless polytetrafluoroethylene/polyimide tape wrap insulation system, with a normal weight nickel coated copper stranded conductor. The polyimide tape shall be hydrolysis resistant.

1.2 Part or Identifying Number (PIN). The complete PIN shall be as follows:



1.2.1 Alloy conductor: Nickel coated copper conductor in accordance with ASTM B355 and table I

TABLE I. Details of construction.

PIN	Wire size (AWG)	Conductor			Finished wire			
		Stranding (number of strand X gauge (AWG) of strands)	Diameter (inches)		Resistance At 20°C ohms/1000ft. (max)	Diameter (inches)		Weight lb/1000ft. (max)
			Min	Max		Min	Max	
04038-8-*	8	133 X 29	.158	.166	.694	.196	.216	61.6
04038-6-*	6	133 X 27	.198	.208	.436	.235	.255	93.7
04038-4-*	4	133 X 25	.250	.263	.275	.292	.312	148
04038-2-*	2	665 X 30	.320	.340	.177	.360	.380	227
04038-1-*	1	817 X 30	.366	.380	.144	.400	.420	295
04038-01-*	0	1045 X 30	.395	.425	.113	.442	.462	351
04038-02-*	00	1330 X 30	.440	.475	.089	.498	.528	438
04038-03-*	000	1665 X 30	.500	.540	.071	.554	.584	554
04038-04-*	0000	2109 X 30	.565	.605	.056	.615	.655	689

* The asterisks in the part number column of table I shall be replaced by color code designator I (see 1.2.2). Example: 04038-26-5D is dark green.

1.2.2 Color. The color of the finished wire shall be as indicated by the insulation color designator (see 1.2) of the wire part number and the color specified in the contract or order. The color designators shall indicate the color of the braid. The preferred color shall be dark green with the Munsell color limits of 5Y 3/2 and 5B 2/0.5, color designator 5D. White is an acceptable alternative color, designator 9.

2. APPLICABLE DOCUMENTS

2.1 Government Documents.

2.1.1 Specifications, standards, and handbook. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

DEPARTMENT OF DEFENSE

MIL-W-22759	-	Wire, Electrical, Fluoropolymer-Insulated, Copper or Copper Alloy
MIL-DTL-22759/84	-	Wire, Electrical, Polytetrafluoroethylene/polyimide Insulated, Normal Weight, Nickel Coated, Copper conductor, 260°C, 600 Volts
MIL-DTL-22759/87	-	Wire, electrical, Polytetrafluoroethylene/Polyimide, Insulated, Normal Weight, Nickel Coated, Copper Conductor, 260°C, 600 Volts

STANDARDS

MIL-STD-104	-	Limits For Electrical Insulation Color
MIL-STD-681	-	Identification Coding and Application Of Hookup and Lead Wire
MIL-STD-2223	-	Test Methods for Insulated Electric Wire

(Copies of these documents are available online at http://assist.daps.dla.mil/quicksearch/ or http://www.dodssp.daps.mil/ or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094).

2.2 Other publications. The following documents form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of the documents, which are DOD adopted, shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue which is current on the date of the solicitation.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B355	-	Standard Specification for Nickel Coated Soft or Annealed Copper Wire
ASTM D4591	-	Standard Test Method for Determining Temperatures and Heats of Transitions of Fluoropolymers by Differential Scanning Calorimetry

(Copies of these documents are available from http://www.astm.org/ or ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, USA 19428-2959.)

NATIONAL CONFERENCE OF STANDARDS LABORATORIES (NCLS)

NCSL Z540.1	-	Laboratories Calibration and Measuring and Test Equipment

(Copies of these documents are available from http://www.ncsli.org or to National Conference of Standards Laboratories (NCSL), 2995 Wilderness Place, Suite 107, Boulder, CO 80301-5404.)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

AS 4373	-	Test Methods for Insulated Electric Wire

(Copies of these documents are available from http://www.sae.org/ or SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001).

(Non-Government standards and other publications are normally available from the organizations which prepare or distribute the documents. These documents also may be available in libraries or from other informational services.)

3. REQUIREMENTS

3.1 DSCC requirements. Items described in this drawing shall meet the requirements of MIL-W-22759 and MIL-DTL-22759/84 except as specified herein. Any requirements included in this drawing shall be in addition to, or supersede those requirements included in MIL-W-22759, MIL-DTL-22759/84 (2 - 4/0 AWG) or MIL-DTL-22759/87 (8 - 4 AWG). In case of conflict between the requirements in this drawing, MIL-W-22759, MIL-DTL-22759/84 (2 - 4/0 AWG) or MIL-DTL-22759/87 (8 – 4 AWG), the requirements of this drawing shall take precedence.

3.2 Design configuration. The design, construction, and physical dimensions shall be as specified in this drawing.

3.2.1 Design documentation. Design documentation shall be retained by the manufacturer and shall be available upon request for review by the contracting activity, DSCC, or contractor.

3.3 Material:

3.3.1 Conductor: Conductors shall be made of soft annealed copper in accordance with ASTM B355 and table I of this drawing. All strands shall free from lumps, kinks, splits, scarred or corroded surfaces and skin impurities. Strands shall be nickel coated. The nickel coating shall not be less than 50 microinches (1.27 µm) when tested in accordance with ASTM B355.

3.3.2. Braid. The braid shall be made of bright aromatic polyamide yarn, 200 Denier, 100 filaments, tightly formed. The braid shall be uniform in appearance and treated with a clear finisher coating. The finisher coating shall be compatible with the temperature rating and performance requirements of the insulated wire.

3.3.3 Insulation: The insulation shall be polytetrafluoroethylene and polytetrafluoroethylene/polyimide tape in accordance with tables II and III.

TABLE II. Wire insulation materials. 1/

Tape code	Thickness Nominal (inches)	Material
1	.0020	.0005 FP/.0010 polyimide/.0005 FP
2	.0010	FP (Skived)
3	.0020	FP (Skived)
4	.0030	FP (Unsintered or presintered bondable)

1/ Physical properties of PTFE unsintered tape shall be in accordance with MIL-W-22759.

TABLE III. Physical properties of FP/Polyimide/FP tapes.

Tensile strength	19,000 lb/in^2 (average min)
Tensile modulus	350,000 lb/in^2 (average min)
Elongation	40 percent (average min)
Dielectric strength	4,000 volts/mil (average min)
.0005 FP Layer	Distinguishable color (next to conductor)

3.4 Wire construction and physical dimensions. See figure 1 and tables I and IV.

TABLE IV. Tape overlap requirements. 1/

Wire size	Wrap 1			Wrap 2			Wrap 3			Wrap 4			Nominal Wall Thickness (mils) 2/
	Tape code	Percent overlap		Tape code	Percent overlap		Tape code	Percent overlap		Tape code	Percent overlap		
		Min	Max		Min	Max		Min	Max		Min	Max	
8	2	20.5	35	1	50.5	55.0	4	67.0	71	-	-	-	13.2
6	2	20.5	35	1	50.5	55.0	4	67.0	71	-	-	-	13.2
4	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
2	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
1	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
1/0	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
2/0	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
3/0	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2
4/0	3	20.5	35	1	50.5	55.0	4	50.5	54.0	4	50.5	54.0	16.2

1/ Wrap 1 is innermost tape which is in contact with the conductor.
2/ Nominal wall thickness does not include the polyamide braid thickness.

3.5 Performance testing: Wire supplied to this drawing shall be qualified in accordance with MIL-DTL-22759/84 (2 - 4/0 AWG) or MIL-DTL-22759/87 (8 - 4 AWG) and shall meet any additional requirements of this drawing.

3.5.1 Insulation state of sinter (quality conformance test): FP layers shall be evaluated with a Differential Scanning Calorimeter in accordance with ASTM D4591. This is performed on the sintered wire prior to braiding. The FP layers shall meet the following requirements:

a. First Heat: Less than 25 Joules/gram (j/g).
b. Second Heat: Maximum 2 j/g change when compared to first heat.
c. Bonding between FP layers shall be homogenous. No evidence of tape edges or seams shall be present on the outer FP layer when visually examined with the unaided eye. The outer surface will be smooth and free of tape edges at the overlap.

3.5.2 Lamination sealing (quality conformance test). When tested in accordance with AS4373 method 809 at 260°C, there shall be no evidence of tape separation or lifting. There shall be no visible tape ridges that can contribute to tearing of the tape. This test is performed on the sintered wire prior to braiding.

3.5.3 Color: Conformity of color to the limits of MIL-STD-104 shall not be required after oven exposure.

3.6 Ratings:

3.6.1 Temperature rating: 260°C maximum continuous conductor temperature.

3.6.2 Voltage rating: 600 Vrms at sea level.

3.7 Marking. The finished wire shall be identified by a printed marking applied to the outer surface or the wire. The identification mark shall not be applied by hot stamp marking or other methods which significantly penetrate the insulation. The PIN shall be in accordance with 1.2 herein.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.1.1 Equipment calibration. All test equipment and inspection facilities shall be maintained in accordance with NCSL Z540.1 or equivalent.

4.2 Qualification inspection. The product manufactured under this drawing shall be currently listed on the qualified products list QPL-22759 for wire type MIL-DTL-22759/84 (2 – 4/0 AWG) or MIL-DTL-22759/87 (8 – 4 AWG). The requirements in paragraph 3.5 shall apply.

4.3 Quality conformance. Quality conformance inspection shall be in accordance with MIL-W-22759, MIL-DTL-22759/84 (2 – 4/0 AWG) or MIL-DTL-22759/87 (8 – 4 AWG) and 3.6 herein.

4.4 Certification: In order to be certified and listed as an approved source of supply for wire manufactured to this drawing, a manufacturer shall:

a. Agree to make available to DSCC, upon request, all pertinent test data indicating compliance to the tests outlined in MIL-W-22759, MIL-DTL-22759/84 (2 - 4/0 AWG) or MIL-DTL-22759/87 (8 - 4 AWG), and this drawing.

b. Provide to DSCC-VAI, or its designated agent, upon request, free of change and without obligation, current production samples of the types and quantities requested.

c. Meet one of the following criteria:

(1) Currently be listed on QPL-22759 for at least one wire series (not necessarily the one for which this drawing applies).

(2) Be in current production of the subject part.

4.5 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply (see 6.6).

5 PACKAGING.

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6 NOTES

6.1 Intended use. Wires conforming to this drawing are intended for use when military specifications do not exist for wires that will perform the required function. This drawing is intended to prevent the proliferation of unnecessary duplicate specifications, drawings and stock catalog listings. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-22759, this drawing will be inactivated.

6.2 Ordering data. The acquisition document should specify the following:

a. Complete PIN (see 1.2).

b. Requirements for delivery of a copy of the quality conformance inspection data for the lot being supplied, if applicable. This data should be supplied with each shipment.

c. Requirements for certificate of compliance, if applicable.

d. Requirements for packaging and packing.

e. (As needed)

6.3 Replaceability. Wires covered by this drawing will replace the same generic wires covered by a contractor-prepared specification or drawing.

6.4 Comments. Comments on this drawing should be directed to DSCC-VAI, Post Office Box 3990, Columbus, Ohio 43218-3990, or e-mail to RectangularConnector@dla.mil, telephone (614) 692-0566, or facsimile (614) 692-6939.

6.5 Certificate of compliance. The certificate of compliance submitted to DSCC-VAI, prior to listing as an approved source of supply, shall state that the manufacturer's product meets the requirements of this drawing.

6.6 Generic test data. Generic test data may be used to satisfy the requirements of 4.3. Generic test data shall be on date coded wire no more than 1 year old when the wire is made of the same material, of the same design, and is made using the same manufacturing processes. The vendor is required to retain the generic data for a period of not less than 3 years from the date of shipment.

6.7 Approved sources of supply. Approved sources of supply are listed herein. Additional sources will be added as they become available. The vendors listed have agreed to the contents of this drawing and a certificate of compliance has been submitted to DSCC-VAI.

DSCC drawing PIN	Vendor CAGE Number	Vendor CAGE Number	Vendor similar PIN 1/
04038-8-*	12814	28427	SMLE8-X
04038-6-*	12814	28427	SMLE6-X
04038-4-*	12814	28427	SMLE4-X
04038-3-*	12814	28427	SMLE2-X
04038-1-*	12814	28427	SMLE1-X
04038-01-*	12814	28427	SMLE01-X
04038-2-*	12814	28427	SMLE02-X
04038-03-*	12814	28427	SMLE03-X
04038-04-*	12814	28427	SMLE04-X

1/ Caution: Parts must be purchased to this DSCC PIN to assure that all performance requirements and tests are met.

* Color code designators in accordance with MIL-STD-681 shall replace the asterisks in the part number column of table. Example: 04038-26-93 is white with an orange stripe.

Vendor CAGE number	Vendor name and address
12814	Thermax/CDT 235 North Freeport Drive Nogales, AZ 85621-2428
28427	Thermax/CDT Barcel Division 2851 Alton Parkway Irvine, CA 92606-5145